IN THE CLAIMS:

1. (Currently Amended) Apparatus for detecting structural damage to a composite pressure vessel, the apparatus comprising:

an optical fiber having a first end and a second end adhered to an exterior surface of the composite pressure vessel; ~~and,~~

an injector operable to inject a light signal into the first end of the optical fiber; and,

a detector operable to detect a reflected portion of the light signal at the first end of the optical fiber ~~damage to the fiber~~ that is representative of a location of damage to the vessel.

2. (Canceled)

3. (Currently Amended) The apparatus of claim 1 ~~claim 2,~~ further comprising:

a comparator operable to compare first and second light signals injected into the optical fiber at different times.

4. (Currently Amended) Apparatus for detecting structural damage to a composite pressure vessel, the apparatus comprising:

an optical fiber adhered to an exterior surface of the composite pressure vessel; and

a detector operable to detect damage to the fiber that is representative of damage to the vessel,

~~The apparatus of claim 2,~~ wherein the detector comprises:

an injector operable to inject a light signal into an end of the optical fiber; and

a detector operable to detect the light signal at an end of the optical fiber

wherein the light signal injector and detector are both coupled to a first end of the optical fiber, and wherein a second end of the optical fiber comprises a

reflector operative to reflect a light signal injected into the first end of the optical fiber back to the first end thereof.

5. (Original) The apparatus of claim 4, further comprising a fiber optic connector at the first end of the optical fiber.

6. (Original) The apparatus of claim 4, wherein the light signal injector further comprises a pulser operable to pulse the light signal injected into the optical fiber.

7. (Currently Amended) The apparatus of claim 1 ~~claim 2~~, wherein the light signal injector comprises a laser or a light emitting diode.

8. (Currently Amended) The apparatus of claim 1 ~~claim 2~~, wherein the ~~light signal~~ detector comprises a PIN diode or an avalanche photodiode.

9. (Original) The apparatus of claim 1, wherein the optical fiber includes a core comprising silica or a polymer.

10. (Original) The apparatus of claim 1, wherein the optical fiber is adhered to the exterior surface of the composite pressure vessel with a resin.

11. (Original) The apparatus of claim 10, wherein the optical fiber is embedded in the resin.

12. (Original) The apparatus of claim 1, wherein the composite pressure vessel comprises a composite overwrapped pressure vessel ("COPV").

13. (Original) The apparatus of claim 1, wherein the composite pressure vessel comprises a high pressure gas storage vessel, a liquid propellant tank, or a solid rocket motor case.

14. (Canceled)

15. (Currently Amended) A method for detecting structural damage to a filament wound composite pressure vessel, the method comprising: ~~The method of claim 14, further comprising:~~

winding an optical fiber on and adhering it to an exterior surface of the composite pressure vessel;

injecting first and second light signals into an end of the optical fiber at different times;

detecting the first and second light signals at an end of the optical fiber;

comparing the first and second light signals with each other;

injecting a light signal into a first end of the optical fiber;

reflecting the light signal from an opposite second end of the optical fiber; and,

detecting the reflected light signal at the first end of the optical fiber.

16. (Original) The method of claim 15, further comprising;

providing a two-dimensional map of the optical fiber on the exterior surface of the composite pressure vessel;

detecting a reflected light signal corresponding to a discontinuity in the optical fiber;

measuring the amount of time taken by the reflected light signal to travel from the first end of the fiber to the discontinuity and back to the first end;

computing the distance of the discontinuity from the first end of the optical fiber from the time taken; and,

locating the discontinuity on the map.

17. (Original) The method of claim 16, wherein the light signal comprises a pulsed light signal.

18. (Currently Amended) A method for detecting structural damage to a filament wound composite pressure vessel, the method comprising:

winding an optical fiber on and adhering it to an exterior surface of the composite pressure vessel;

injecting first and second light signals into an end of the optical fiber at different times;

detecting the first and second light signals at an end of the optical fiber; and,

comparing the first and second light signals with each other, ~~The method of claim 14,~~

wherein winding the optical fiber comprises winding the fiber while it is wetted with a liquid resin, and wherein adhering the optical fiber comprises curing the liquid resin.

19. (Currently Amended) The method of claim 18 ~~claim 14~~, wherein the optical fiber is wound on the composite pressure vessel in a uniform, two-dimensional pattern in which adjacent windings are spaced at a selected distance from each other.

20. (Currently Amended) A method for detecting structural damage to a filament wound composite pressure vessel, the method comprising:

winding an optical fiber on and adhering it to an exterior surface of the composite pressure vessel;

injecting first and second light signals into an end of the optical fiber at different times; and

detecting the first and second light signals at an end of the optical fiber;

comparing the first and second light signals with each other, ~~The method of claim 19,~~

wherein the optical fiber is wound on the composite pressure vessel in a uniform, two-dimensional pattern in which adjacent windings are spaced at a selected distance from each other, and

wherein the winding pattern comprises at least one of helical and axial windings.